

REMARKS

The present invention relates to an optical display apparatus which includes a reflection-type hologram and a light source. The reflection type hologram is formed by light having information of an object which is obtained by using light having passed through a slit, and reference light having an incident optical path which is different from that of the light having the information of the object. A reconstructed image of the object is displayed using light from the light source.

Claims 1, 4-7, 13 and 15-18 are currently pending.

Claim 1 has been canceled.

Claims 4, 6, 7, 13 and 17 have been amended.

37 C.F.R. § 1.98 Requirement:

The communication from the Examiner dated January 4, 2001, indicates that the three Japanese language references have not been considered by the Examiner because the form 1449 filed by the applicant failed to provide English references as required by the MPEP 609 or 37 C.F.R. § 1.98. Further, the communication reads that "the International Search Report does not fulfill the requirement set forth in 37 C.F.R. 1.98 since there is no 'concise explanation of the relevance' of these references".

The May 19, 1992 issue of the Official Gazette includes a section entitled "Processing of Information Disclosure Statements Under the New Rules Effective March 16, 1992". At 1138 TMOG 40, the Official Gazette provides that "Where the information listed is not in the English language, but was cited in a search report by a foreign patent office in a counterpart foreign application, the requirement for a concise explanation of relevance can be satisfied by submitting an English language version of the search report which indicates the degree of relevance found by the foreign office."

↑ No degree of relevance

Since Applicants' have provided an international search report which indicates the degree relevance found by the foreign office, it is respectfully submitted that the requirement for a concise explanation of relevance has been satisfied. Therefore, it is requested that the three Japanese language references be considered.

35 U.S.C. § 112 Claim Rejections:

Claims 1, 4-7 and 17-18 stand rejected under 35 U.S.C. § 112 as being indefinite. Claims 4, 6 and 7 have been amended to incorporate the features recited in claim 1 and to address the indefiniteness rejections directed towards claim 1, as detailed below.

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Amended claim 4 defines a positional relationship between the object and the slit and recites "...the object which is positioned between a slit and the transmission-type hologram...". This positional relationship clarifies that the slit is different from the object.

Amended claim 6 recites "...a slit which is arranged to be adjacent to the transmission-type hologram on which an image of the object is recorded". Claim 7 includes a similar feature. This clarifies that the slit recited in claims 6 and 7 is different from the object recited.

Therefore, the rejection under 35 U.S.C. § 112 that it is unclear whether or not the slit is the object should be overcome.

Amended claim 4 recites "...a transmission-type hologram which is formed by: object light obtained by irradiating the object...with diffused light having passed through the slit...". This clarifies that the slit recited in claim 4 is used to record the transmission-type hologram. Amended claim 4 does not include the feature of "...a reflection-type hologram formed by: light having information of an object which is obtained by using light having passing through a slit...", which was previously included in claim 1. This clarifies that the slit recited in claim 4 is not used to record the reflection-type hologram.

Amended claim 6 includes the feature of “a reflection-type hologram formed by: light having information of the object...the light having information of the object is light which is obtained by passing reconstructed light of a transmission type hologram through a slit...”. Further, claim 6 recites that the slit “is arranged to be adjacent to the transmission-type hologram...”. Claim 7 includes similar features. This makes clear that the slit recited in claims 6 and 7 is used in forming a reflection type hologram, and is not used in forming a transmission type hologram.

Therefore, the rejection of claims 4, 6, and 7 under 35 U.S.C. § 112 indicating that it is not clear if the slit is the same slit used to record the transmission hologram, and whether the slit is used to reconstruct the object information beam when used to record the reflection-type hologram should be overcome.

Amended claim 7 recites “a cylindrical lens having its generatrix along a longitudinal direction of the aperture of the slit”. Therefore, the rejection of claim 7 under 35 U.S.C. § 112 indicating that it is not clear what direction is considered to be the “longitudinal direction” should be overcome.

In amended claim 17, line 4, “the slit” has been replaced with “a slit”. Therefore, the rejection of claims 17 and 18 under 35 U.S.C. § 112 as lacking proper antecedent basis should be overcome.

35 U.S.C. § 103(a) Claim Rejections:

Reconsideration and allowance of claims 4 and 6-7, which stand “rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Molteni et al. (PN. 5,662,815) in view of the patent issued to Benton (PN. 4,498,729)”, is respectfully requested. Molteni discloses heads-up and heads-down displays which employ holographic stereograms. Benton discloses a method of producing achromatic holographic images of an object, and a diffraction grating useful for making an achromatic hologram.

Applicants’ invention, as recited by amended claim 4, includes a feature which is neither disclosed nor suggested by Molteni or Benton, namely:

...a transmission-type hologram which is formed by:
object light obtained by irradiating the object which is
positioned between a slit and the transmission-type
hologram...

This means that claim 4 recites a hologram which is formed by light having information of the object. The light having information of the object is obtained by reconstructing a transmission-type hologram. The recited feature indicates that the transmission-type hologram is formed by object light obtained by irradiating the object, and the object is positioned between a slit and the transmission-type hologram. The feature of the object being positioned between a slit and the transmission-type hologram can be found in the originally filed application at page 71, lines 4-19, and further at Figures 39A and Figure 39B. No new matter has been added.

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In contrast, Molteni teaches to position the slit 29 between the transmission-type hologram H1 and the object 26 (See Molteni, Figure 5). Further, in Benton, the slit (30, 31) is positioned adjacent to the transmission-type hologram (H1). Therefore, neither Molteni, nor Benton teaches to position the object between the slit and the transmission-type hologram, as in claim 4 of the present application.

It is because Applicants include the feature of a transmission-type hologram formed by object light obtained by irradiating the object which is positioned between a slit and the transmission-type hologram, that a hologram of an improved quality is produced.

Accordingly, for the reasons set forth above, claim 4 is patentable over the combination of Molteni and Benton.

Claim 5 stands "rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Molteni et al. and Benton as applied to claims 1 and 4 above, and further in view of the patent issued to Ohdner et al. (PN. 5,613,022)." Ohdner does not make up for the deficiencies of Molteni and Benton with respect to claim 4. Therefore, claim 4 is patentable over the combination of Molteni, Benton and Ohdner. Claim 5 includes all of the features

of claim 4 from which it depends. Accordingly, claim 5 is also patentable over the combination of Molteni, Benton and Ohdner for the reasons set forth above.

Applicants' invention, as recited by amended claim 6, includes a feature which is neither disclosed nor suggested by Molteni or Benton, namely:

... a reflection-type hologram is formed by: light having information of an object; and reference light having an incident optical path different from that of the light having the information of the object... wherein the light having the information of the object is light which is obtained by passing reconstructed light of a transmission-type hologram through a slit...

This means that the reflection-type hologram recited in claim 6 is formed by light having information of an object, and reference light having an incident optical path that is different from the path of the light having the information of the object. Further, the light having the information of the object is light which is obtained by passing reconstructed light of a transmission-type hologram through a slit. The feature of a reflection-type hologram formed by light having information of the object which is obtained by passing reconstructed light of a transmission-type hologram through a slit can be found in the originally filed application at page 29, line 27 through page 30, line 4. No new matter has been added.

In the Office Action dated October 13, 2000, the Examiner indicated that Molteni does not explicitly teach that the reconstructed light for the transmission-type hologram (H1) passes through a slit (See Molteni, Figure 6). However, the Examiner indicated that Benton discloses this feature. The Examiner related the claimed reflection-type hologram to the hologram H2 which is disclosed in Figure 3 of Benton. Applicants respectfully disagree.

There is no indication in Benton that the hologram H2 is a reflection-type hologram, as is recited in claim 6. On the contrary, it is apparent that the hologram H2 of Benton is a transmission-type hologram, and not a reflection-type hologram. In Figure 5 of Benton, the illuminating light (light

collimated by lens 48) is irradiated from the left side of the hologram H2. The hologram H2 then transmits reconstructed light toward the hologram H3 from the right side of the hologram H2. It is apparent from the geometric relationship between the illuminating light and the reconstructed light that the hologram H2 is a transmission-type hologram.

Therefore, neither Molteni nor Benton include the recited feature of claim 6.

It is because Applicants' include the feature of a reflection-type hologram formed by light having information of an object, and reference light having an incident optical path different from that of the light having the information of the object, and the light having the information of the object is light which is obtained by passing reconstructed light of a transmission-type hologram through a slit, that a hologram of an improved quality is produced.

Accordingly, for the reasons set forth above, claim 6 is patentable over the combination of Molteni and Benton. Claim 7, while not identical to claim 6, includes features similar to claim 6. Thus, claim 7 is also patentable over the combination of Molteni and Benton for the reasons set forth above.

Reconsideration and allowance of claims 13 and 15-16, which stand "rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Molteni et al", is respectfully requested. Applicants' invention, as recited by amended claim 13, includes a feature which is neither disclosed nor suggested by Molteni, namely:

...a reflection-type hologram is formed by: light having information of an object which is obtained by using diffused light diffusing in only one direction of the hologram; and reference light having an incident optical path different from that of the light having the information of the object...

This means that the reflection-type hologram recited in claim 13 is formed by light having information of an object which is obtained by using

diffused light diffusing in only one direction of the hologram, and reference light having an incident optical path different from that of the light having the information of the object. The feature of the light having information of the object obtained by using diffused light diffusing in only one direction can be found in the originally filed application at page 39, lines 24-29. No new matter has been added.

In contrast, the diffused light in Molteni does not diffuse in only one direction, as in claim 13 of the present application. The diffusion screen 30 of Molteni diffuses a transmitting light in both the vertical direction and the horizontal direction (See Molteni, Col. 15, lines 11-29).

Accordingly, for the reasons set forth above, claim 13 is patentable over Molteni, as are claims 15 and 16 which are dependent upon claim 13.


Claims 17 and 18 stand "rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Molteni et al. as applied to claim 13 above, and further in view of the patent issued to Benton." Benton does not make up for the deficiencies of Molteni with respect to claim 13. Therefore, claim 13 is patentable over the combination of Molteni and Benton. Claims 17-18 include all of the features of claim 13 from which they depend, either directly or indirectly. Thus, claims 17-18 are also patentable over the combination of Molteni and Benton for the reasons set forth above.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested.

Request for Extension of Time:

In the subject application, it is requested that the shortened period for responding to the Official Action dated October 13, 2000 be extended three months until April 13, 2001. Enclosed is the Patent Application processing fee under 37 C.F.R. § 1.17.

Respectfully Submitted,



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Enclosures:

Check for \$890.00

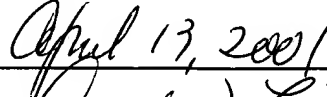
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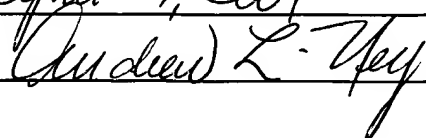
Dated: April 13, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADECLAIMS:

1 4. (Amended) An optical display apparatus [according to claim
2 1], comprising a hologram device and a light source, wherein the hologram is a
3 reflection-type hologram formed by:

4 light having information of an object; and

5 reference light having an incident optical path different from that of
6 the light having the information of the object wherein

7 a reconstructed image of the object is displayed by light from the
8 light source, and wherein

9 the light having the information of the object is reconstructed light
10 obtained by reconstructing a transmission-type hologram which is formed by:
11 object light obtained by irradiating the object (which is positioned between a slit
12 and the transmission-type hologram) with diffused light having passed through the
13 slit; and irradiation light having an incident optical path different from that of the
14 object light.

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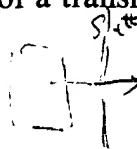
1 6. (Amended) An optical display apparatus [according to claim
2 1], comprising a hologram device and a light source, wherein the hologram is a
3 reflection-type hologram formed by:

4 light having information of an object; and

5 reference light having an incident optical path different from that of
6 the light having the information of the object wherein

7 a reconstructed image of the object is displayed by light from the
8 light source, and wherein

9 the light having the information of the object is light which is
10 obtained by passing reconstructed light of a transmission-type hologram [which



11 is obtained by passing] through [the] a slit which is arranged to be adjacent to the
12 transmission-type hologram on which an image of the object is recorded.

1 7. (Amended) An optical display apparatus [according to claim
2 1], comprising a hologram device and a light source, wherein the hologram is a
3 reflection-type hologram formed by:

4 light having information of an object; and

5 reference light having an incident optical path different from that of
6 the light having the information of the object, wherein

7 a reconstructed image of the object is displayed by light from the
8 light source, and wherein

9 the light having the information of the object is light which is
10 obtained by passing reconstructed light of a transmission-type hologram [which
11 is obtained by passing] through: a [the] slit having an aperture which is arranged
12 to be adjacent to the transmission-type hologram on which an image of the object
13 is recorded; and a cylindrical lens having its generatrix along a longitudinal
14 direction of the aperture of the slit.

1 13. (Amended) An optical display apparatus, comprising a
2 hologram device and a light source, wherein the hologram is a reflection-type
3 hologram formed by:

4 light having information of an object which is obtained by using
5 diffused light diffusing in only one direction of the hologram; and

6 reference light having an incident optical path different from that of
7 the light having the information of the object, and wherein

8 a reconstructed image of the object is displayed by light from the
9 light source.

1 17. (Amended) An optical display apparatus according to claim
2 13, wherein the light having the information of the object is light which is

Original
slit
as
object

- 3 obtained by passing reconstructed light of a transmission-type hologram [which
4 is obtained by passing] through [the] a slit which is arranged to be adjacent to the
5 transmission-type hologram on which an image of the object is recorded.

Claim 1 has been canceled.